NEW DEVELOPMENTS IN NUTRITION RESEARCH

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This year has brought to light many facts about the nutrients needed by the animal body. These facts give us a new basis for interpreting the value of foods in the human dietary. As we gain a knowledge of the role foods play in the physiological economy of man, we are developing a greater respect for some of the foods available to us.

But we do not yet know what constitutes an adequate diet for man. This is obvious since many persons with presumably satisfactory dietary habits have gray hair and decayed teeth at an early age and suffer from diseases which are possibly dietary in origin.

The animal body requires about fifty different dietary compounds, no one of which can substitute for the other. Of these fifty nutrients, some of the less known vitamins are now claiming special attention. New roles have been found for some of them, and their action in the body is now more clearly defined. From the standpoint of human nutrition, recent findings on certain of the B-vitamins are pertinent and provocative.

In the early days of nutrition experimentation, the prolonged feeding of various types of diets led to paralysis. Recent experiments have shown that a deficiency of biotin results in paralysis. It now seems probable that the aforementioned diets may have been deficient in this vitamin. The possibility exists, too, that the paralysis found in aged people may be due to inadequate consumption of foods rich in biotin.

The recent discovery of the relationship of biotin to resistance to disease has created much interest. It has been reported, for example, that malaria in chicks is less severe and less frequently fatal when diets rich in biotin are fed. It is not known, however, whether biotin has anything to do with the prevention of malaria in human beings.

A hint as to the mode of action of biotin in building and maintaining resistance to disease might be found in the fact that this vitamin apparently is closely related to lysozyme, a protective enzyme found in all body fluids. This enzyme is capable of dissolving bacteria which invade the body.

Folic acid and pyridoxine aid the body in resisting disease by helping the blood constituents ward off invading bacteria. They are also necessary to prevent anemia. In addition, folic acid has a specific inhibiting effect on tumor growth, and inositol seems to have the same effect.

New Facts About Better Known Vitamins

Recently, riboflavin was found to aid the body in resisting disease. Specifically, riboflavin maintains the integrity of certain body tissues and detoxifies certain chemical compounds harmful to the body. As a result of the past year's work, it is now clear that this B-vitamin is one of the very important nutrients involved in the formation and maintenance of red blood cells.

Latest investigations have shown that riboflavin is also necessary for in-utero development of the osseous parts of the body. Unusual errors in the formation of the skeleton occur in animals born of mothers which have been fed a poor diet. These errors have been traced to a lack of riboflavin in the diet of the mother during pregnancy.

Doctor Holmes

Vitamin E has been on the official list of nutrients for many years. It is necessary for reproduction and long has been recognized as a substance important in muscle nutrition.

Very recent research work has revealed that this role of maintaining muscle extends to the muscles of the heart. This discovery is very significant and may point the way to the prevention of much of the heart disease so prevalent today.

Each year more facts are revealed which add drama to the study of human nutrition. Each year we come nearer to explaining why the body behaves as it does.

We are gradually finding out why a diet of milk, fruits, vegetables, eggs, meat, and whole grains is best for maintaining body health. We are justifying the classification we have given these foods, i. e., "protective foods".

Glances AT NUTRITION RESEARCH

The following notes on the vitamin content of milk were adapted from an address, "New Developments in Nutrition Research", by Dr. Julia Outhouse Holmes, Professor of Nutrition Research, Massachusetts State College, 1944 Annual Summer Conference, National Dairy Council.

Biotin . . Synthesis of biotin in the intestinal tract of humans was found when three quarts of milk, supplemented only by iron, copper, manganese, and sugar, were fed. The fact that subjects excreted more biotin than the milk furnished might indicate that man's need for dietary biotin decreases as the quality of his food improves. —*J. Am. Diet. Assn. 19:683, 1944.*

It has been estimated that human adults need 150 mcg. of biotin daily; one quart of milk can supply approximately one third that amount.— *J. Am. Med. Assn. 118:1119, 1942.*

In addition to being a vital component of all living matter and indispensable for growth, biotin now appears to be one of the factors which control resistance to disease. This may explain current success in treating animal malaria with biotin-rich diets. —*Proc. Soc. Exp. Biol. & Med. 55:107, 1944.*

Folic Acid . . Quantitatively, milk cannot be classified as being among the best sources of folic acid. However, with milk in the diet, it is possible that intestinal bacteria may produce folic acid. Only very minute amounts of this new vitamin are needed to inhibit tumor growth.—*Proc. Soc. Exp. Biol. & Med. 55:204, 1944.*

Inositol . . Milk is a good source of inositol; one liter contains about 180 mg. A good diet should supply about 980 mg. One quart of milk provides approximately one fifth of the adult's daily need for this tumor-inhibiting vitamin.—*J. Am. Med. Assn. 119:1, 1942.*

Pyridoxine . . The extent to which white blood cells destroy bacteria depends upon the presence of pyridoxine in the diet.—*J. Immunol. 47:493, 1943.*

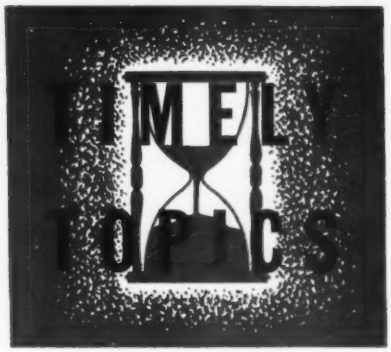
The regeneration of hemoglobin and the formation of the red blood cells are interfered with when a pyridoxine-deficient diet is fed. In addition, iron cannot be used properly by the body. —*J. Biol. Chem. 153:171, 1944.*

The daily human requirement for pyridoxine is not yet known. However, a good diet should supply 1.5 mg. One quart of milk contains about 0.67 mg. of this vitamin. Obviously, milk could easily supply much of the needs for pyridoxine.—*J. Nut. 27:415, 1944.*

Riboflavin . . Recent work shows that the riboflavin content of milk varies only slightly from 1.5 mg. per liter. This is true regardless of season or type of feed. Pasteurization does not affect this value. If this is the minimum riboflavin content of milk, one quart of milk could supply 70% of the average adult allowance.—*Am. J. Dis. Child. 66:607, 1943.*

When riboflavin is exposed to light for appreciable periods of time, its vitamin activity is decreased. Since this impairment increases with increasing temperature, it is desirable to keep milk in a cold, dark place. During cookery, all foods should be covered in order to preserve their riboflavin. —*J. Am. Chem. Soc. 66:662, 1944.*

Thiamine . . The importance of milk as a source of thiamine has not been duly stressed. Investigators have reported values ranging from 0.35 to 0.50 mg. per liter. The consumption of 1 quart of milk daily would provide much of the adult allowance recommended by the National Research Council. If, as recent work indicates, these allowances are too high, then milk will assume a dietary role of even greater importance than it is now accorded.—*J. Nut. 24: 139, 1942.*



Dr. Julia Outhouse Holmes, author of this month's leading article, is professor of nutrition research at Massachusetts State College, Amherst. Dr. Holmes was formerly professor of nutrition in the Department of Home Economics at the University of Illinois. In 1941 she was the recipient of the Borden award. This award is given yearly to a scientist in the field of home economics for outstanding nutrition research done on milk. Much of Dr. Holmes' research has been devoted to the study of calcium metabolism in human beings.

A recent estimate made by the Bureau of Human Nutrition and Home Economics shows dairy products contributed the following food energy and nutrients in the civilian food supply for 1943.

Food energy	20%	Riboflavin	48%
Protein	24%	Fat	27%
Calcium	78%	Vitamin A	27%
		Phosphorus	39%

The national school lunch program for the 1944-45 school year is assured by the appropriation by Congress of $50,000,000 for its operation. It is designed to operate under local sponsorship of school boards or civic groups. The War Food Administration reimburses local sponsors for their purchases of food up to a maximum amount determined by the type of lunch served. Free meals are provided to children unable to pay for them.

NUTRITION WORKSHOP BENEFITS PUERTO RICO

By Miss Esther Seijo Tizol, Assistant Director Extension Service in charge of Home Demonstration Work, University of Puerto Rico, Rio Piedras

Pledges made just one year ago to strive for a "Healthier and Happier Puerto Rico" have been adequately fulfilled. In June of 1943, the first nutrition workshop in Puerto Rico was held at the University of Puerto Rico, sponsored by the Nutrition Program Division of the Office of Distribution and directed by Dr. Lydia J. Roberts, of the University of Chicago. Federal and Insular Agencies selected 63 participants from all over the island and Virgin Islands to attend.

Nutritional deficiencies in the Puerto Rican diet have long been recognized, but it was not until there was an organized effort on the part of all educational leaders, as an outgrowth of the workshop, that something was really done about them. Nutritionists, horticultural specialists, animal husbandry specialists, fruit specialists, home economists, health workers and local leaders set out systematically to improve the nutrition of the people of the Island.

To understand the elation of all participants of the workshop in the progress made, it is necessary to know the nutrition problems of Puerto Rico.

The main foods in the diet of the average Puerto Rican are rice, beans, codfish, and starchy vegetables or tanniers. All of these foods with the exception of the latter must be imported. Thus, it is easy to see what happened to Puerto Rico when war came.

The poor people, who make up almost three fourths of the population, faced starvation. Few ships ventured through enemy-infested waters. The price of rice, beans, and codfish rose beyond all ability to purchase. Even locally produced foods increased in price because of the demand.

Local Nutrition Committees

Due to the efforts of the 63 participants of the workshop who fully realized our nutrition problems, each of the 76 municipalities of Puerto Rico have organized nutrition committees which are promoting the use of protective foods.

Specifically, these local committees have assisted in distributing seed for planting yellow vegetables, have given demonstrations on how to use milk, how to grow and cook vegetables, have held health contests, exhibits on wise selection of foods, and organized classes for training teachers in nutrition. Local committees have also encouraged the raising of cattle, goats and rabbits.

An effective demonstration was carried on by several of the committees to show the importance of milk in the diet through rat experiments. For example, two rats were given the diet of the laborers of that area, and two others were fed a well-balanced diet including milk. At the end of 21 days, the first rats had gained an ounce of weight, had skin irritations and loss of hair. The second two rats gained 3½ ounces and were in good condition. This was a great teacher to all who attended.

Another example of how the story of nutrition spreads throughout the island is the fact that one of our local nutrition committee chairman through his splendid work gained the reputation of "Mr. Nutrition" in his community.

A Broad Program

Men participants as well as women have carried the story of nutrition to their communities. This is not easy. It has meant overcoming long-established food habits. It has meant urging the people to plant the small amount of soil available with soybeans and other nutritious vegetables, and raising more cows and goats for milk, and rabbits or goats for meat. It has involved overcoming the idea that some native fruits, guavas, mangos, and papayas were poisonous or harmful. It has entailed development of family food budgets which ensured adequate meals for a family of six on $45 a month.

Much of Puerto Rico's nutrition problem is economic, but education on how to be as well nourished as possible, on the money available, is the task at hand. Milk centers have been established by many localities where mothers and children can obtain free milk and learn its value.

To us who have struggled many years in trying to develop better food habits among our people, the results of the nutrition workshop have been gratifying. Thus, Puerto Rico, through united educational efforts, truely is becoming healthier and happier.

TEACHING NUTRITION IN TRAILER CAMPS

By Dorothy Throssell, Field Nutritionist, Summit County Health Department, Akron, Ohio

Trailer camps in wartime offer a wide field for investigation and improvement in the nutritional status of the occupants. In former years trailer camps were considered to be largely summer vacationing problems, with occupants classed as transients in the community. However, today trailer camps have become, of necessity, homes for large numbers of workers, in and near large industrial centers, or towns where new war centers have been located.

As a community problem, the need for nutrition education for trailer camp occupants is recognized by health and sanitation agencies and schools in trailer districts. Therefore, requests for such education may come from industrial plants, public health nurses, sanitarians or from schools reporting undernourished children. Often a request comes from camp owners or directors themselves, who recognize the many difficulties camp residents encounter.

Before any class is planned, a careful survey is made of special problems faced by each camp, particularly those which may affect the dietary of families living therein. For example, we try to learn what proportion of mothers are employed full or part-time; whether they carry packed lunches or use plant cafeterias; whether they work nights or swing-shift. In this way, we know what interference there may be with regular, well-planned meals for children and other members of the family.

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DID YOU KNOW

—that in Peru baby welfare centers named "Gotas de Leche" (drops of milk) are established to provide needed milk for babies?

—that there are more cows than people in the state of Wisconsin?

—that milk is an excellent food for blood donors? It contains riboflavin, pyridoxine, and casein which are needed for hemoglobin regeneration.

—that the proverbial milk and honey diet will provide adequate amounts of calcium, phosphorus, thiamine, riboflavin, ascorbic acid, pantothenic acid, nicotinic acid for adults?

—that airplanes are a farm machine? Low-flying planes are used to plant rice in California rice fields.

—that our soldiers in Guadalcanal are planting gardens to provide fresh foods? The report is that 3 or 4 crops a year can be raised on the fertile island soil.

—that milk sugar (lactose) is a desirable food for the molds which make penicillin?

—that milk of water buffalo is slightly bluish, but it is high in butterfat content?

—that guava powder is being widely used by British Troops as a source of vitamin C and is receiving attention in this country?

THINGS YOU'LL LIKE TO READ

LUNCH AT SCHOOL—U. S. Department of Agriculture, War Food Administration, Office of Distribution, Washington, D. C. 1944. Free.

A pamphlet describing the school lunch program, its operation, who sponsors the program, and what schools are eligible for admission to the federal school-lunch program under the War Food Administration.

SCHOOL LUNCH MANAGEMENT — U. S. Office of Education, Nutrition Education Series, Pamphlet No. 3. Federal Security Agency, Washington, D. C. 1944. Free.

A booklet which discusses the organization of the school lunch room, type of meals to serve, and enumerates the problems of school lunch rooms already established in different sections of the United States. A helpful booklet for those beginning a school lunch room and a good check for cafeterias already in existence.

NEW DEVELOPMENTS IN NUTRITION RESEARCH—Dr. J. O. Holmes. National Dairy Council, Chicago 6, Illinois. 1944. Free.

A resume of the new developments in research with particular emphasis on vitamins. May be obtained by writing to the National Dairy Council.

INADEQUATE DIETS AND NUTRITIONAL DEFICIENCIES IN THE UNITED STATES — Publications Office, National Research Council, 2101 Constitution Ave., Washington 25, D. C. 1943. 50 cents.

A comprehensive survey of diet and nutritional deficiencies of American people shows wide-spread need for improvement. An excellent reference book on the nutritional status of the nation.

TEACHING NUTRITION IN TRAILER CAMPS

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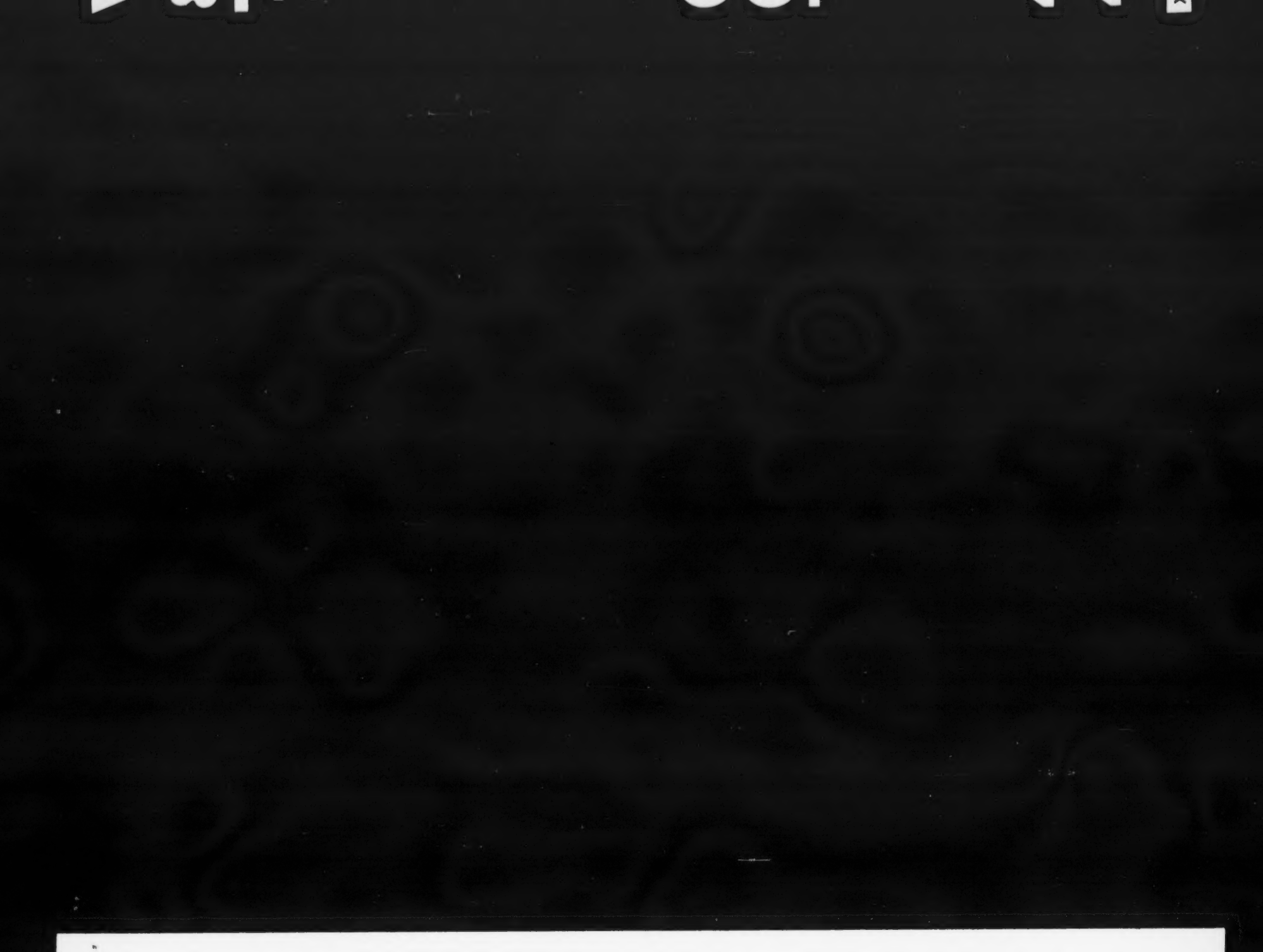
It is also important to know what markets or other sources of food supply are located conveniently near the camp; whether they offer good food selection at reasonable cost; whether the milk supply is good and falls within regulations of the Health Department; whether a good school lunch is maintained by schools where camp children attend.

At our first meeting with a group of women from a camp we urge them to discuss with us their problems of food purchasing and preparation, transportations to markets and equipment and storage space. All of these factors influence their ability to make practical improvement in better food selection and better preparation of meals for their families. Such discussion arouses women's interest in making any improvements possible.

Information obtained from the women is used in setting up five two-hour lessons. These lessons included demonstrations on how to plan and prepare balanced meals in spite of difficulties with marketing, food shortages and poor equipment.

At least one meeting is given to discussion and demonstration of "top-of-the-stove" meals, since ovens are small and often unreliable. Another meeting is devoted to the planning of home-packed lunches. These two particular problems are the biggest problems of women in trailer camps who are trying to improve the family's nutrition.

The other three meetings cover subjects ranging from practical discussions of the vitamin and mineral values of foods to the planning of home gardens, food preservation and storage. Great interest is shown in dehydration of foods, since storage space for food is almost non-existent in a trailer. Trained food experts from various agencies are asked to meet with the groups to acquaint the women with sources of information on food or marketing problems and illustrative material.

Education in nutrition given to these groups has surprisingly wide circulation. In many cases, where camps are close to government construction projects, workers remain for a time and then move to another project. For this reason special emphasis is laid on setting up good nutrition goals for the women, and then giving them practical ways of adjusting themselves and keeping good nutrition standards under often-changing conditions.